ALBERTA OIL & GAS INDUSTRY QUARTERLY UPDATE

FALL 2015

Reporting on the period: June 20, 2015 to September 22, 2015

All about oil and gas

While Alberta and its petroleum sector has endured the hurt of sinking world crude oil prices and continued weak natural gas prices, the province is well positioned to rebound once the cyclical nature of commodity prices eventually recalibrates.

In fact, technological advancement has set the stage for another boom in Alberta's non-oil sands oil and natural gas industry. Until the turn of the last decade, the sun had slowly been setting on Alberta's conventional oil and natural gas industry. Oil production had declined from a peak of 1.43 million barrels per day (bbls/d) in 1973 to a low of around 460,000 bbls/d in 2010.

But things have changed for the better, as increased implementation of long horizontal wells and multistage fracturing in tight oil plays across the province—not to mention improved provincial royalty incentives to encourage drilling—has crude oil drilling activity and production on the upswing.

In fact, the tight oil revolution that began in the U.S. gradually moved north into Alberta, marking the dawning of a new day for oil and natural gas exploration and production in the province.

In Alberta, the technology is being used in an increasing number of oil plays. Among the most advanced plays are the Cardium in west-central Alberta, the Beaverhill Lake Carbonates near Swan Hills and the Viking in east-central Alberta.

More importantly, emerging liquids-rich plays like the Montney and Duvernay shale show great promise. In fact, the Duvernay play may have the most potential going forward.

At the end of 2014, industry giants such as Chevron Canada and Encana reported strong liquids yields, particularly for valuable condensate, and producers are preparing to ramp up activity this year.

The Duvernay is often compared to the prolific Eagle Ford of Texas because they are both shale plays that offer a full spectrum, from dry gas through liquids-rich gas to oil. Many other shale plays, such as the Horn River Basin in B.C. and the Marcellus or Barnett south of the border, are much more gas-focused.

In terms of the potential size of the play area, the richness of the source rock and even some of the early production results, the Duvernay "is well on its way to being as big or bigger than the Eagle Ford," Canadian Discovery has proclaimed.

The increase in horizontal drilling activity is expected to offset the steep decline in Alberta conventional production that would otherwise be expected.

The Alberta Energy Regulator estimates the remaining established reserves of conventional crude oil in Alberta to be 1.8 billion bbls, representing more than one-third of Canada's remaining conventional reserves. This increase of 1.6 per cent over the 2013 estimate is from all reserve adjustments less production in 2014.

The province's production of conventional crude oil totalled 215 million bbls in 2014, an increase of 1.3 per cent.

The province is also the largest contributor to Canadian oil and equivalent production and is the only contributor of upgraded and non-upgraded bitumen, which are the marketed components of raw bitumen production.

Alberta is Canada's largest producer of marketable natural gas. In 2013, Alberta produced 69 per cent of Canada's total production, down from 70 per cent in 2012. Over the same period, Canada's second-largest contributor, B.C., increased its share from 25 per cent to 26 per cent.

Canada is the third-largest natural gas producer in the world, with the majority of the country's gas being produced in Alberta. According to provincial figures, at the end of 2014, remaining established reserves of conventional natural gas stood at 30.7 trillion cubic feet (tcf), while remaining established coalbed methane gas reserves stood at 2.4 tcf. The province estimates the remaining ultimate potential of marketable conventional natural gas at 74 tcf.

Although conventional natural gas remains a very important part of Alberta's natural gas supply, horizontal drilling and multistage fracturing now allow for development of natural gas from a new source—unconventional natural gas resources. ■

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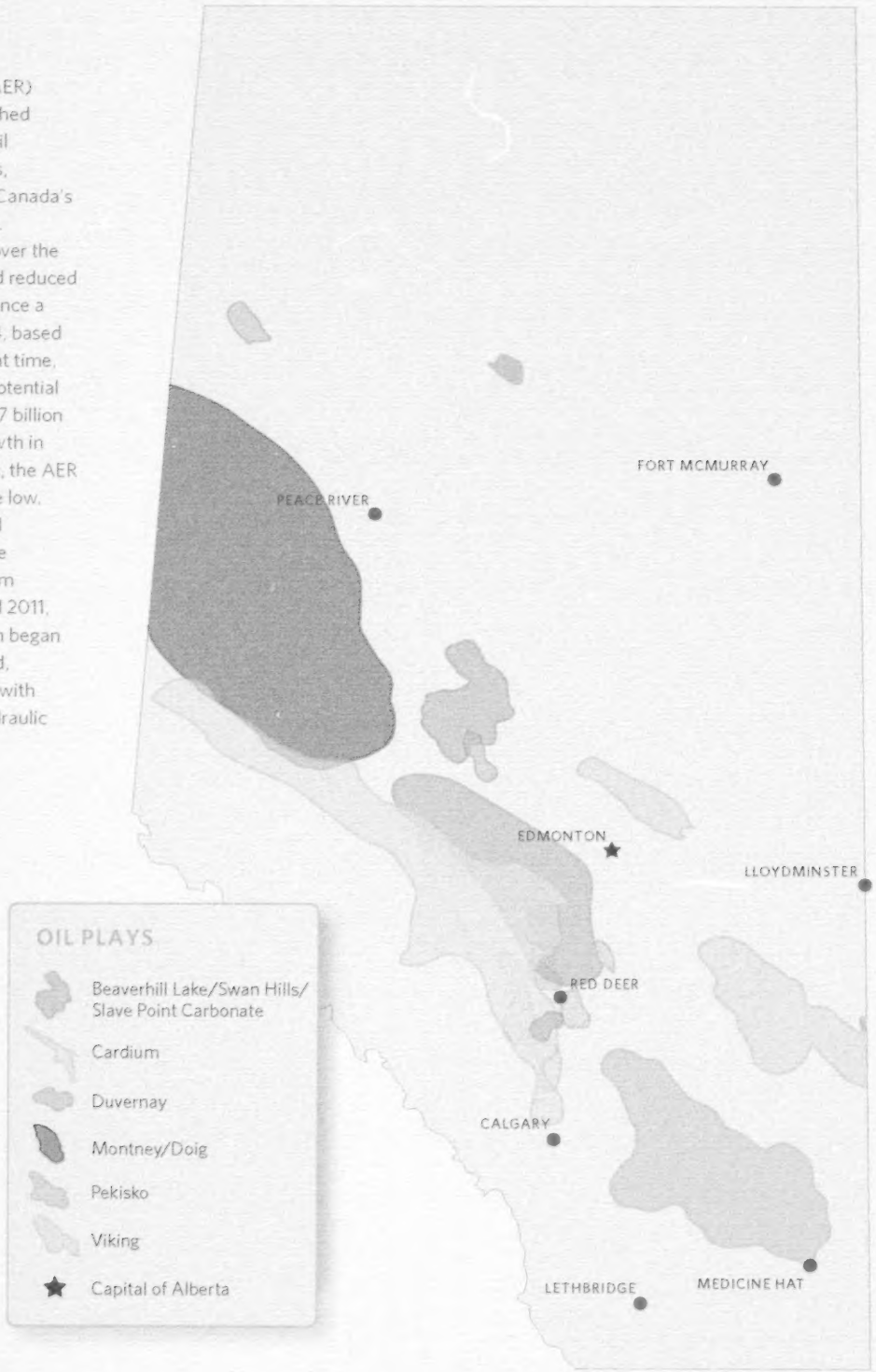
NOTE: This publication contains information about Alberta's oil and gas industry, excluding the oil sands. For information on the oil sands, please refer to the *Alberta Oil Sands Industry Quarterly Update* on this website.

OIL PLAYS

The Alberta Energy Regulator (AER) estimates the remaining established reserves of conventional crude oil in Alberta to be 1.8 billion barrels, representing about one-third of Canada's remaining conventional reserves.

Though the pace has slowed over the past year due to low oil prices and reduced activity, it's expected to resume once a market correction occurs. In 1994, based on the geological prospects at that time, the AER estimated the ultimate potential of conventional crude oil to be 19.7 billion barrels. Given recent reserve growth in low permeability, or tight oil plays, the AER believes that this estimate may be low.

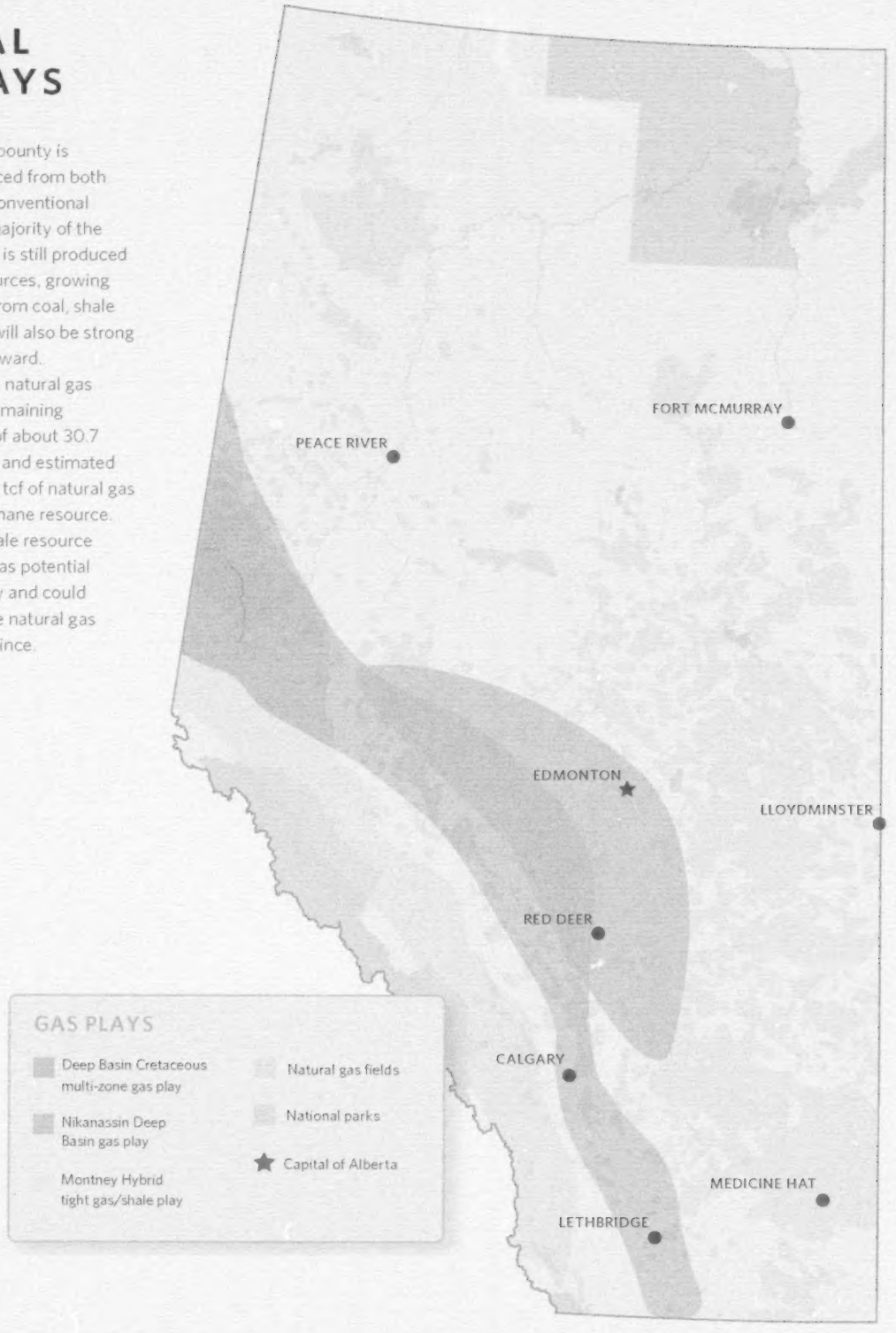
Starting in 2010, total crude oil production in Alberta reversed the downward trend that was the norm since the early 1970s. In 2010 and 2011, light-medium crude oil production began to increase as a result of increased, mainly horizontal, drilling activity with the introduction of multistage hydraulic fracturing technology.



NATURAL GAS PLAYS

Alberta's natural gas bounty is plentiful and is produced from both conventional and unconventional reserves. While the majority of the province's natural gas is still produced from conventional sources, growing natural gas volumes from coal, shale and tight formations will also be strong contributors going forward.

Alberta has a large natural gas resource base, with remaining established reserves of about 30.7 trillion cubic feet (tcf) and estimated potential of up to 500 tcf of natural gas from the coalbed methane resource. In addition, a large-scale resource assessment of shale gas potential in Alberta is underway and could significantly add to the natural gas prospects for the province.



GOVERNMENT UPDATE

Alberta Government

CLIMATE CHANGE ADVISORY PANEL HEARS FROM ALBERTANS

Alberta's Climate Change Advisory Panel is hearing from Albertans about their ideas on how the province can do its part to address the global issue of climate change. An online survey has been available since late August, and in September, open houses were held in Calgary and Edmonton. The panel will also hear from industry, municipalities, academics, First Nations and Métis communities. A discussion guide, available online, provides an outline of key issues and areas the panel will explore and investigate.

Input gathered through these Climate Leadership Discussions will be used to help form the foundation of Alberta's new proposal to address climate change, which will be in place in time for the COP 21 world summit in Paris in December.

"Climate change is a threat we all face, affecting everything from our health, food production and fresh water, to biodiversity and our economy. Our government is committed to demonstrating real leadership on the environment and on climate change," said Shannon Phillips, minister of environment and parks. "Over the coming weeks, all Albertans will have an opportunity to contribute to their province's new plan to address this pressing global issue here at home."

The panel, selected by Minister Phillips and chaired by Andrew Leach, includes members with distinct skills, valuable networks and a strong understanding of Alberta's unique economic, environmental and social circumstances.

Panel members:

- Andrew Leach, associate professor and academic director of energy programs, University of Alberta School of Business;
- Gord Lambert, the president and chief collaboration officer of GRL Collaboration for Sustainability, formerly of Suncor Energy;
- Linda Coady, chief sustainability officer, Enbridge;
- Stephanie Cairns, principal of Wrangellia Consulting, Pembina Institute board member and International Institute for Sustainable Development board member; and
- Angela Adams, director of education, Unifor, and trustee, Fort McMurray Public School District.

"I am looking forward to hearing from Albertans, both in person and online," said Leach. "The fact is there are no easy solutions to the climate change challenge. We need to ensure we provide government with sound advice to inform the choices that will be made."

ALBERTA'S OIL AND GAS ROYALTY REVIEW NOW UNDERWAY, PANEL HEARING FROM ALBERTANS

The royalty review advisory panel will begin its work connecting with Albertans as it reviews the province's non-renewable resource royalty framework.

Energy economist Peter Tertzakian, former Alberta Deputy Minister of Finance Annette Trimbee and Mayor of Beaverlodge Leona Hanson will work alongside panel chair Dave Mowat, president of ATB Financial. The group will engage with Albertans, energy-related industries and key stakeholders through a combination of meetings, public sessions and interactive, web-baseddiscussions throughout the fall.

"Albertans deserve a royalty system they can trust. We have to get this review right, and doing it right means having an open, frank discussion about how our royalty system can better serve Albertans, industry and the good jobs industry creates for generations to come," said Minister of Energy Margaret McCuaig-Boyd.

The work of the panel will be guided by a mandate to identify ways to optimize:

- returns to Albertans as owners of the resource;
- industry investment;
- diversification opportunities, such as value-added processing, and other innovation; and
- responsible development of Alberta's resources.

The government also committed that the current royalty framework will remain in place until the end of December 2016. If and when changes are made, any incremental revenue will go to the Alberta Heritage Fund.

"I'm excited about the panel we've brought together to do this work. We are all capable and ➤

GOVERNMENT UPDATE CONTINUED

collaborative people, and we intend to tackle this process with the best interests of Alberta and Albertans always top of mind," said Mowat. "We're eager to ask some important questions and hear what people have to say."

Albertans are encouraged to visit letstalkroyalties.ca, where they can submit comments and engage with the panel. The panel is also hosting four community engagement sessions to gather input from Albertans. The first two took place in Grand Prairie on September 15 and Fort McMurray on September 17. The upcoming sessions will be in Calgary on October 5 and in Edmonton on October 6.

Albertans are being asked to consider the following two initial questions:

- What do you think—or want to understand—about the Alberta royalty framework today?
- What would you like this review to accomplish?

This feedback will help guide the process and identify issues for the panel to include in its findings. The royalty review advisory panel will conclude its work by the end of this year and its advice will be considered by the government prior to any decisions on changes to the current royalty structure. For more information, visit letstalkroyalties.ca.

NEW AIR QUALITY RESULTS CONCERNING, ACTION REQUIRED

Results of the Canadian Ambient Air Quality Standards (CAAQS) report released in September indicate that the Red Deer region has exceeded national standards and four other regions are approaching limits.

CAAQS are national standards for particulate matter and ozone exposure. This is the first year of annual reporting by all provinces and territories.

"These results are concerning. We can't keep going down the same path and expecting a different result," said Environment and Parks Minister Phillips.

"Our government has a responsibility to protect the health of Albertans by ensuring air pollution from all sources is addressed. Without action, Alberta is on track to have the worst air quality in Canada in the coming years."

Under CAAQS, the Red Deer air zone now requires a mandatory response action plan to reduce levels below ambient standards. The Lower Athabasca, Upper Athabasca, North Saskatchewan and South Saskatchewan regions require management plans to protect them from potential future exceedances.

Effective immediately, Alberta will implement action plans developed under the national Air Zone Management Framework. The framework has four levels, each of which requires a different degree of management action and planning.

The government is exploring a number of possible options to reduce air pollution emissions, including more stringent standards for industry, standards for vehicles and increased air monitoring.

In October 2012, the Canadian Council of Ministers of the Environment agreed to new CAAQS for fine particulate matter and ozone. CAAQS are part of a collaborative national Air Quality Management System to better protect human health and the environment. Results are calculated using a three-year average of concentrations over annual, 24-hour and eight-hour periods from air monitoring stations. If a region has multiple stations, the one supplying the highest exceedance is used for the entire air zone.

ALBERTA STRENGTHENS ECONOMIC RELATIONS WITH MISSOURI

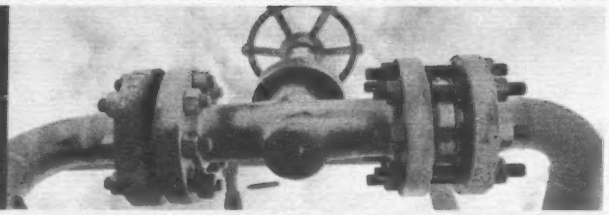
Alberta and Missouri have signed a Memorandum of Understanding (MOU) focused on promoting economic development and trade.

The MOU, signed during Missouri Gov. Jay Nixon's visit to Alberta, provides a framework to collaborate on economic development initiatives in areas such as agriculture, environmental policy and research and innovation. The agreement focuses on enhancing economic development, job growth, competitiveness and barrier-free trade for both jurisdictions.

"This agreement strengthens Alberta's ties to an important trade partner. Enhancing trade and investment, and sharing emerging research and information will be mutually beneficial to both jurisdictions," Premier Rachel Notley said.

Alberta and Missouri have an established history of strong economic ties. From 2010-14, Alberta's exports to Missouri averaged $630 million annually. Alberta's top exports to Missouri include energy and wood products, plastics and chemicals. ■

WHAT'S NEW IN THE OIL & GAS INDUSTRY



NON-RENEWABLE RESOURCE REVENUE FORECAST INCREASED

The Alberta NDP government is forecasting higher non-renewable resource revenue for 2015-16 of $3.58 billion, $710 million higher than the projected budget figure tabled by the former PC administration in March, although numbers in the fiscal first quarter update released Aug. 31 were current as of July.

Since the end of July, WTI has been volatile, dropping into the high-$30 range, before shooting back to the $45/bbl range. The provincial government is working on forecasts for the new provincial budget being tabled this fall.

The current financial year started on April 1, 2015, and ends on March 31, 2016. A 2015-16 budget was introduced March 26 but was not passed, as a provincial election was called. The election on May 5 resulted in the formation of the new NDP government, which will introduce a revised budget for 2015-16 in October.

The outlook for bitumen royalty revenue was hiked to $2.26 billion for 2015-16 from the March budget estimate of $1.36 billion. The crude oil royalty forecast was also raised to $619 million from the budget estimate of $594 million.

The natural gas and by-products royalty estimate for the fiscal year was lowered to $392 million from the previous $450 million.

The bonuses and sales of Crown leases revenue forecast was halved to $157 million for the fiscal year from the March estimate of $315 million.

PRODUCERS COMPLETING A GREATER PERCENTAGE OF GAS WELLS

Gas well completions in western Canada—for both development and exploratory wells—declined to 829 to the end of July from 1,045 in the comparable period last year, but as a percentage of the total (oil, gas or dry wells) it represents 30.4 per cent versus 20.4 per cent a year ago.

Operators working in Alberta completed 651 gas wells to the end of July (excluding experimental wells), down from last year's 691 gas well completions. In B.C., producers have completed 178 gas wells compared to 354 in the January-July period a year ago.

There were 823 oil well completions in Alberta to the end of July (excluding experimental wells) compared to 2,307 a year ago. In Saskatchewan, there were 848 oil well completions in the January-July period, off from 1,481 in the comparable 2014 period.

Including service wells, there were a total of 3,054 well completions booked across the country in the first seven months of 2015.

The number of wells completed (assigned a final status of oil, gas, dry or service) is down from 5,615 last year.

The tally for total metres completed declined to 7.48 million metres in January-July 2015 compared to 12.56 million metres a year ago.

Overall, industry reported 2,465 development completions and 258 exploratory well completions in western Canada (excluding experimental wells) in the first seven months of 2015, compared to 4,696 and 417, respectively, for the year-prior period.

DRILLING FORECAST UNCHANGED

Petroleum Services Association of Canada (PSAC) expects a total of 5,320 wells (rig releases) to be drilled in Canada this year, the associated said in its third-quarter update to the 2015 Canadian Drilling Activity Forecast.

This figure remains unchanged from PSAC's second-quarter (April 2015) update, when it made a substantial downward adjustment, reducing its original forecast of 10,100 wells by 4,780 wells, representing a 47 per cent decrease.

PSAC bases its third-quarter update to the 2015 forecast on average natural gas prices of C$2.50/mcf (AECO), crude oil prices of US$53/bbl (WTI) and the Canadian dollar averaging US$0.77.

"PSAC drilling activity forecast to the end of year remains flat," said Mark Salkeld, PSAC's president and CEO. "By now most of the shock from the steep drop in oil prices we experienced at the beginning of 2015 has been absorbed. The adjustment down last quarter was dramatic, and now oversupply and low cash flows means there's no better news for drilling activity from now to the end of year, except perhaps that it's holding."

- On a provincial basis for 2015, PSAC estimates 2,839 wells to be drilled in Alberta—down 50 per cent from the 5,740 wells in PSAC's original October 2014 forecast.
- In Saskatchewan, the expected well count is now 1,660 wells, less than half of the 3,365 wells originally forecasted, but 153 wells higher than forecasted in the April 2015 update.
- Manitoba is forecasted to drill 251 wells, down by 179 wells from the original forecast. ➤

WHAT'S NEW IN THE OIL & GAS INDUSTRY CONTINUED

- British Columbia's count has been nominally increased to 559, down from 555 forecasted originally.

"Small changes with rig counts up in one area and down in another means the numbers have balanced out across the map and the overall forecast picture remains unchanged. Better performance in Saskatchewan, where top performing producers were in a position to take advantage of lower overall service and completion costs, was balanced by a drop in Alberta where a lot of uncertainty has added to the chill from the oil price shock," Salkeld said.

"B.C. LNG potential remains a promising incentive for exploration activity, but access to global LNG markets is critical—without it production will remain flat and Canada will miss out in the global market."

PSAC will be releasing its 2016 Canadian Drilling Activity Forecast on November 3.

ENERGY REGULATOR INCREASES FOCUS ON PIPELINE SECTOR

The Alberta Energy Regulator (AER) says most of the increase in the province's pipeline incident rate—to 1.6 per 1,000 kilometres in 2014 from 1.4 per 1,000 kilometres in 2013—can be attributed to its focusing more attention on the pipeline sector through inspections and education.

The increase is also due to operators doing a better job of checking their lines and reporting any problems, says the regulator's 2014-15 annual report.

"While the overall incident rate was up, most of that increase was because of smaller incidents with limited environmental impacts; there were fewer large pipeline releases in 2014," says the report.

The AER classifies large pipeline releases as those that spill more than 200 cubic metres, have entered surface water or are likely to do so, have released to an environmentally sensitive area or require implementation of the Petroleum Industry Incident Support Plan.

The largest incident in 2014 was a release of 1,600 cubic metres of produced water near Whitecourt because of a break in an Apache Canada pipeline.

According to Bob Curran, AER director of communications, in 2014, 601 cubic metres of hydrocarbon were spilled, and 8,799 cubic metres of water was spilled.

In 2013, 1,250 cubic metres of hydrocarbon was spilled, and 19,818 cubic metres of water was spilled.

He said the regulator requires pipeline operators to report all pipeline incidents, including breaks, test failures and external contact with a pipeline, regardless of whether there is an actual leak.

Total gas flared was within the provincial guidelines of 670 million cubic metres, at approximately 485 million cubic metres, down from 495 million cubic metres in 2013.

Gas vented in 2014 measured an estimated 445 million cubic metres, up from 403 million cubic metres in 2013.

The report attributes the higher venting volumes to increases in heavy oil production in 2014.

These estimates are currently under technical review by the AER. The numbers do not include flared and vented volumes from bitumen upgraders and oilsands mine operations.

CANYON WILL DEFEND PRICING

Executives at Calgary-based Canyon Services Group re-affirmed their intent to stand firm on pricing during the current downturn, despite competitors that seem determined to work at unprofitable rates.

In a second-quarter conference call, Canyon chief executive Brad Fedora noted other pressure-pumpers are choosing to work in western Canada at or below cost, often in order to gain "strategic" customers.

"There's nothing strategic about losing money," he said. "It's utter nonsense to think there are strategic implications to going to work at or below cost."

At the same time, since crude oil WTI prices have drifted down to the high US$40s from about $65 only a few weeks prior, he told analysts now is not the time to push producers for more favourable rates. Yet, he made clear the company will stand by the rates it believes are fair and allow for a profit.

"We've picked our horses and we're going to defend our market share. We've got the company to a size that it's running well. Everybody's busy, they're happy with what they're making and we're going to continue to tweak the cost side."

Nonetheless, he said the company is battling "irrational" pricing by heavy-weight competitors, both Canadian and American, and has made a decision to step away from work that ultimately pays no dividends.

"We've removed ourselves from portions of the market where people want to work for cost or below cost. That's fine. You can have it," he said. "The wear and tear on our equipment is real. If you want to go and beat up your equipment for cost or five per cent below cost, then go to it." ■

TECHNOLOGY UPDATE

SECOND ROUND OF INNOVATIVE CARBON USE GRAND CHALLENGE LAUNCHED

The focus is narrower and the stakes higher for the second round of the Climate Change and Emissions Management Corporation (CCEMC) Grand Challenge: Innovative Carbon Uses.

With submissions due Jan. 18, 2016, Alberta-based CCEMC has launched round two of its $35-million international competition in search of technologies that turn captured carbon dioxide emissions into useful projects while reducing greenhouse gases (GHGs). The second round emphasizes projects that can be commercialized in Alberta by 2020 and that can lower GHG emissions by one megatonne annually.

"If there is a product that can be generated with high value and can demand a fairly high price, then that is a way to help cover carbon capture costs—because you have to capture the carbon in order to turn it into a useful product," Kirk Andries, managing director of CCEMC, says.

He adds that oil and gas companies should be interested in the challenge, as it helps resolve financial feasibility concerns associated with carbon capture and storage (CCS).

"The CCS side of the business from a technology point of view can be done, but it is not yet economic, and it costs too much to do it. If it is $120 per tonne to capture carbon, then that is very expensive. A [grand challenge] outcome we are hopeful for is that instead of having regulatory push, we are trying to generate a market pull," Andries says.

He added: "If captured carbon is repurposed and becomes an enabling starting material, instead of a waste stream, we are confident it will attract new businesses and create new markets."

COLLABORATION LOOKS TO PUSH FORWARD MULTI-ZONAL COMPLETION TECHNOLOGY

Packers Plus, in conjunction with a subsidiary of Acacia Research Corporation, announced in August their collaboration on the licensing of a set of fundamental patents related to multi-zonal completion of horizontal wells including ball-drop, sliding sleeve and packer technology for use in the hydraulic fracturing of both tight and conventional oil and gas reservoirs.

This technology has been applied in oilfields across North America and worldwide, and has contributed significantly to the tremendous growth in oil and gas production from unconventional shale formations.

"We are pleased to be working with Acacia as our licensing partner for these patents because of their proven expertise and success in obtaining fair value for the use of intellectual property," says Dan Themig, president and CEO of Packers Plus.

"This transaction enables us to further unlock the investment and the value from our R&D while focusing our internal resources and investments in developing and delivering world-class completion technologies to the market."

CATHEDRAL ENHANCES TECHNOLOGY PLATFORM

In July, Cathedral Energy officially released three product enhancements to its proprietary Fusion measurement-while-drilling technology platform.

The enhancements include superior electromagnetic transmission capabilities, the ability to collect downhole drilling diagnostics and further ruggedizing the Fusion platform to operate in increasingly demanding drilling environments, the company said.

"With these enhancements, Cathedral's ElectroMagnetic technology can be relied on by our customers in more formations and drilling environments than competitive technologies," the company said. "In addition, the enhanced Fusion technology platform will offer customers superior reliability and performance compared to other systems."

Cathedral has been developing and manufacturing its own proprietary measurement-while-drilling technology platform since 2002, and in 2007, technology development was brought fully in-house. These technology development efforts have resulted in Cathedral's EM technology being recognized as best-in-class in the directional drilling industry, the company said. The in-house technology development and manufacturing capability also positions Cathedral to be highly responsive to customer needs and quickly adapt its technology for specific applications and situations. ■

LABOUR UPDATE

WAGE AND SALARY REBALANCING CONTINUES

Over the past 10 years, average weekly earnings in the Alberta oil and gas sector have risen by 56 per cent compared to 48 per cent for all industries in Alberta and 29 per cent for Canadians in all industries, notes Todd Hirsch, chief economist for ATB Financial.

"The reality is that cost containment has been very difficult in the petroleum sector and in this province in particular," said Hirsch. "Companies felt that to get projects going, to get people out there on the rigs, to find and attract the talent, we have to pay the compensation to attract them."

Faced with the need to reduce costs, there now is a long-overdue effort on the part of oil companies to rebalance wages and salaries, which account for an average of 70 per cent of a company's costs, he said. The result has been layoffs, especially in the highly paid, highly skilled professional and technical jobs.

Despite the layoffs, total Alberta employment is up about 40,000 year-over-year as companies in the non-energy sector are picking up employees—but at far lower salaries, said Hirsch. One sector that is seeing an increase in employment is trucking and warehousing, which 18 months ago was having difficulty attracting workers. "Now [those companies] are competitive."

Alberta wages, bonuses, salaries and other costs will also need to come down, not only in the petroleum industry but also in Alberta's overall industry, in order to rebalance the economy, the luncheon heard. That has already been underway for about a year, and the province is likely to see more of that in the coming months, Hirsch predicted.

ROTATIONAL WORKFORCE AND WORK CAMPS INCREASINGLY VITAL

Alberta's rotational workforce is not a temporary business choice, but rather an ongoing business requirement that supports industry growth and Canada's economic well-being, says a newly released Petroleum Labour Market Information (PetroLMI) report, which calls for further research on the subject.

According to *Rotating, Not Relocating: Alberta's Oil and Gas Rotational Workforce*, in the last decade rotational work arrangements have increased in number, becoming commonplace and essential to the energy sector, as well as associated construction and maintenance projects. This nimble workforce can grow and shrink in size depending on the operating requirements and commodity price trends.

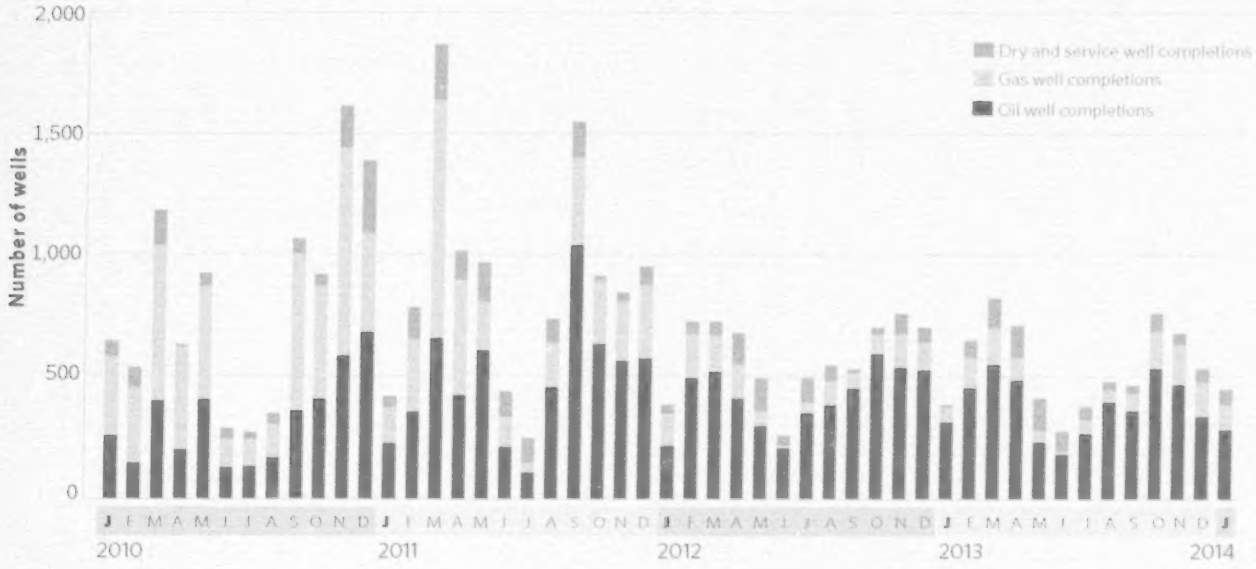
While PetroLMI does not have a conclusive number, director Carol Howes says the most recent National Household Survey indicated that approximately 42,000 Canadians, including 30,000 Albertans, were rotational workers as of 2011.

"We think that number is quite conservative, and certainly there has been an increase in the number of rotational workers since then," she said, adding the Regional Municipality of Wood Buffalo conducted a telephone survey in 2012 estimating 39,000 rotational workers in that region. A follow-up survey in 2014 determined about 47,000 workers in regional accommodations.

"An ongoing survey of these workers would be very helpful. Regular reporting that compares a place of work and a place of residence would be helpful. In other words, you could get a good sense of if someone is living in Newfoundland and working in Alberta [for example], if we have ongoing, regular reporting of that sort of data." ■

OIL & GAS STATISTICS

ALBERTA WELL COMPLETIONS


2,000
1,500
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Number of wells
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Gas well completions
Oil well completions
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2010
2011
2012
2013
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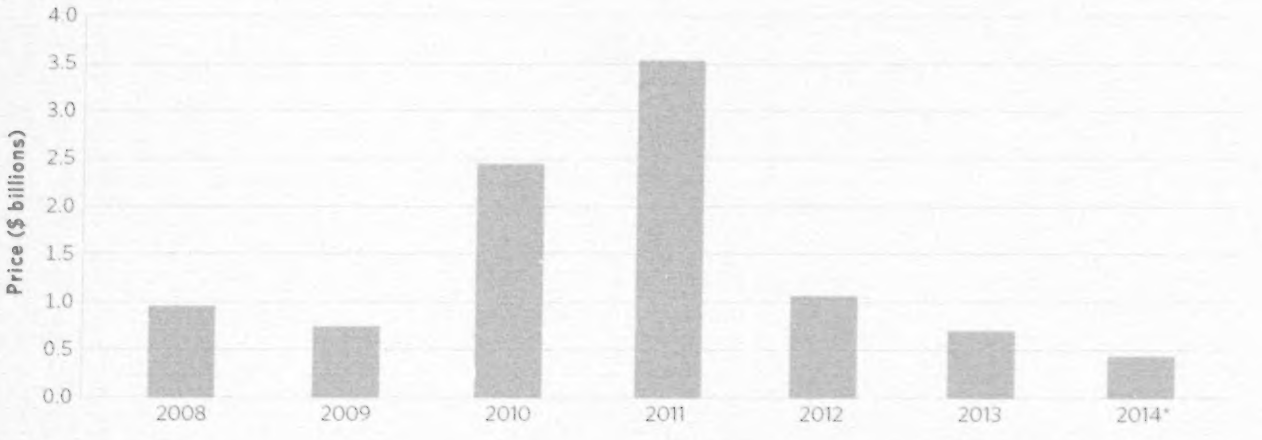
ALBERTA CROWN LAND SALES

Petroleum and natural gas rights, excluding oil sands



STATISTICS CONTINUED

DRILLING RIG COUNT BY PROVINCE/TERRITORY

August 2015

	ACTIVE	DOWN	TOTAL	ACTIVE
Western Canada				(Per cent of total)
Alberta	125	410	535	23
Saskatchewan	20	105	125	16
British Columbia	37	48	83	45
Manitoba	5	11	16	31
WC total	187	572	759	25
Eastern Canada				(Per cent of total)
Quebec	0	1	1	0
Canada total	**187**	**573**	**760**	**25**

Source: JuneWarren-Nickle's Energy Group

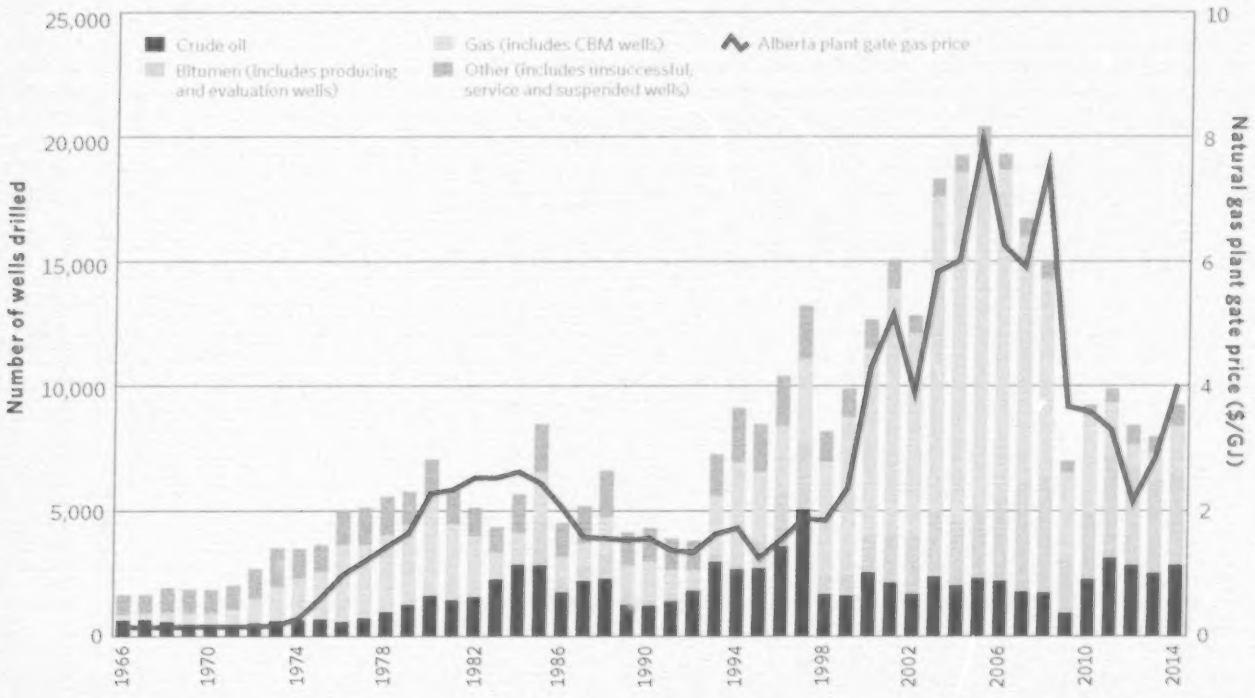
OIL AND GAS WELL COMPLETIONS BY PROVINCE

August 2015

	OIL WELLS		GAS WELLS	
Western Canada	AUG '14	AUG '15	AUG '14	AUG '15
Alberta	259	189	70	108
British Columbia	4	0	14	37
Manitoba	48	33	0	0
Saskatchewan	338	259	0	0
Total	**649**	**481**	**84**	**145**

Source: JuneWarren-Nickle's Energy Group

DRILLING ACTIVITY IN ALBERTA, 1966–2014



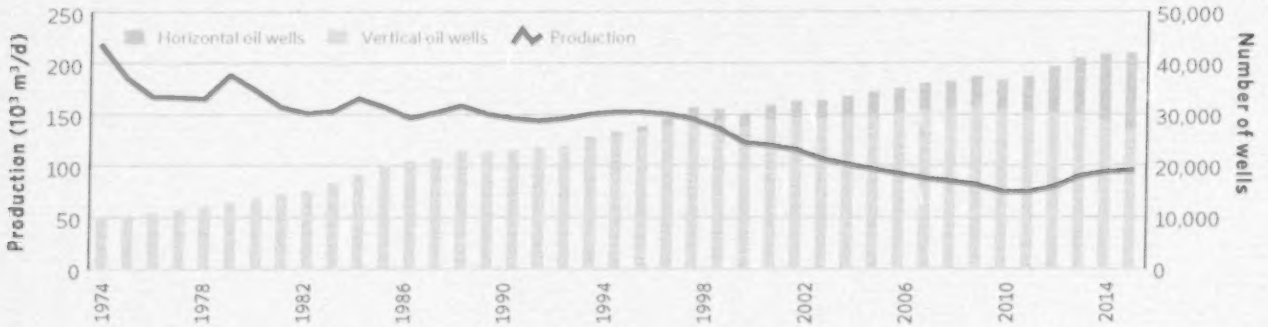
Source: Alberta Energy Regulator

STATISTICS CONTINUED

ALBERTA MARKETABLE GAS PRODUCTION

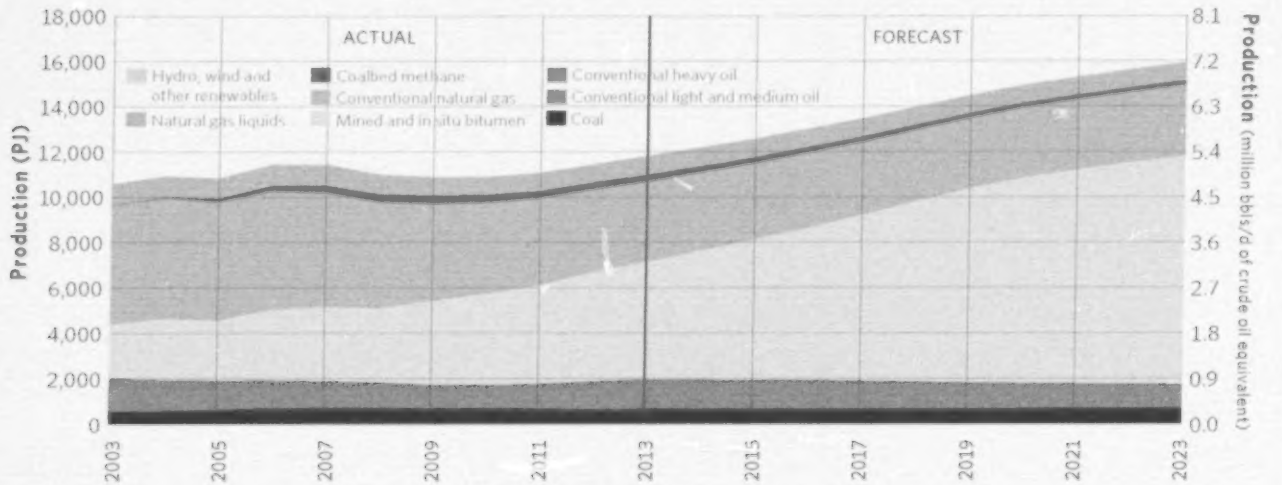
Source: Alberta Energy Regulator

ALBERTA CRUDE OIL PRODUCTION AND PRODUCING WELLS



Source: Alberta Energy Regulator

TOTAL PRIMARY ENERGY PRODUCTION IN ALBERTA



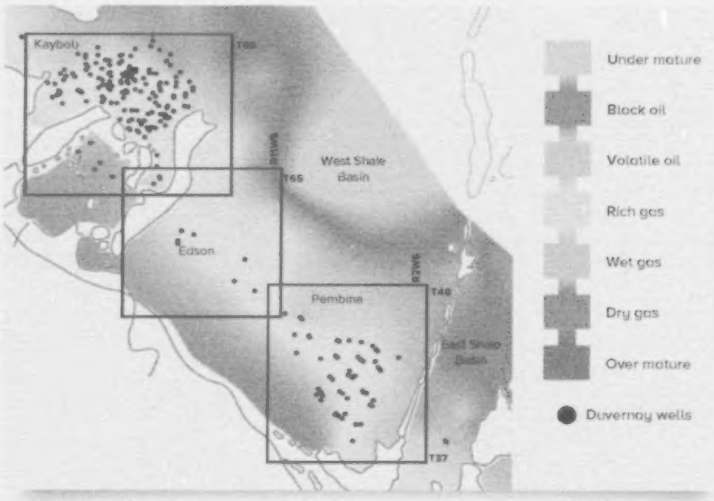
Source: Alberta Energy Regulator

THE DUVERNAY CONTINUES TO EMERGE

In December 2009, the Alberta government's final land sale of the year generated an eye-widening $384.3 million—a bright spot in what had been, to that point, a pedestrian year for provincial Crown auctions.

The Duvernay play in Alberta's Deep Basin was identified as a chief reason for the high bonus bids paid at this sale, and this was merely the opening act—it kicked off an over-two-year boom in Crown land spending. The apex came on June 1, 2011, when Alberta attracted a massive $843.03 million—an all-time high for a single sale—fuelled by the Duvernay.

With most of the prospective land spoken for, the question now is, will the Duvernay fulfill its promise as the next star play of North America, or were those billions in land-acquisition dollars spent in vain?



Duvernay Fairway

According to a November 2013 study by BMO Capital Markets, drilling results over the last 1.5 years have confirmed the existence of multi-phase windows—dry gas, liquids-rich gas, volatile oil and black oil—and the ability of the reservoir to behave as a true, over-pressured shale reservoir and, from most windows, deliver hydrocarbons economically.

The Alberta government's royalty regime favours Duvernay gas wells over Duvernay oil wells, which suggests activity, at least in the near term, will be relegated to defining and drilling in the condensate- and natural gas liquids-rich windows, the study notes.

"It is with this continued investment that the Duvernay shale has emerged as a highly sought-after, world-class unconventional shale play, with a focus now on condensate—the new gold," BMO stated.

EARLY WELL RESULTS

Canadian Discovery identified 59 wells that report production from the Duvernay in Alberta, with 50 of these wells still on stream at Aug. 31, 2013.

The well with the highest oil rate is at that time was a Royal Dutch Shell well in the Kaybob Field at 15-09-063-20W5, which averaged about 200 barrels per day of oil (bbls/d) during that month. The best condensate rate was from an Encana well at 06-09-063-23W5 in the Waskahigan Field, which averaged 480 bbls/d. And the best gas rate came from a Chevron Canada well at Kaybob South 02-16-062-20W5, which averaged about 2.5 million cubic feet per day in August.

It's still too early to declare the play a commercial success, Canadian Discovery admitted, as operators are currently experiencing a range of successes.

"However, indications are that after operators determine the areas with the greatest potential and which completion programs work effectively in those areas, the project costs will come down significantly enough to provide long-term strong economics," the firm said.

FUTURE DEVELOPMENT

Brad Hayes, president of Petrel Robertson Consulting, said that while 2014 was an important year for the Duvernay, he did not characterize it as a pivotal one. Companies will continue to optimize their drilling and completions practices, and some, such as Chevron and Encana, will ramp up development in areas they see as economic.

"The play will progress, but it's unlikely there will be any pivotal events that will suddenly change the course of overall development—we're a few years into it, and there are many more to go," he said. "Duvernay lands in the areas where commerciality is reasonably envisioned—around the liquids-rich part of the fairway—are quite tightly held.

"There are some land opportunities in areas of uncertain economic merit—in the dry gas or oil areas—but there is unlikely to be much more land activity in these areas until their productive and commercial merits are proven up."

BMO said the type well economics show that liquids-rich Duvernay gas wells are profitable and that the condensate has the greatest impact on value. This has led to operators pushing the play boundaries further into the oily phase window in their quest for higher condensate yields. ■

DUVERNAY DRILLING AND COMPLETION COSTS CONTINUE TO DECLINE

For more on the Duvernay, see the *Daily Oil Bulletin*'s special digital magazine of the play.

ENCANA DRIVES DOWN DUVERNAY DRILLING AND COMPLETION COSTS

It's a rare occurrence when Encana shuffles out an operational update before its quarterly release and corresponding conference call.

But that's exactly what the company did on September 9. As president and chief executive officer Doug Suttles told the New York City-based Barclays CEO Energy/Power conference that when it comes to the Duvernay play, there's a good reason why.

"The interesting story we find here is no one believes our well costs. We're constantly told this play doesn't work because well costs in the Duvernay are $20 million. And of course our well costs used to be $20 million, [but] our most recent pad came in at $10.4 million," he said.

"These costs are real, and when you combine them with our type curve...you'll find that the economics—even at today's prices—work here."

Suttles said that a steep reduction in drilling times have aided the cause.

"First of all, we're drilling wells faster. In 2013 in the Simonette area, which is the area we're developing, our average drill time was 46 days per well to drill a 6,500-foot lateral. Our most recent performance is we're drilling a 7,200-foot lateral in 27 days—so 19 fewer days per well," he said.

Suttles added that the company has also optimized its drill bit designs and bottomhole assemblies, changed the diameter of hole sizes and typically now does eight-well pads in the Duvernay.

"These items are saving us on the drilling side about $3 million per well," he said.

On the completion side, Suttles noted that Encana is further cutting costs by doubling the number of fracs pumped in a day.

"We've now done two pads where we run two frac spreads simultaneously on the pad. Schlumberger tells us it's the only two times it has ever been done in the world," he said.

"That's also doubling, once again, the number of fracs per day. It also is reducing the completion time by 28 days, which substantially saves on the associated completion costs. In fact, when you add all of these things together on the completion side, we're now saving over $7 million per well compared to 2013.

"Our new target is to break through the $10-million barrier, and we hope to actually soon achieve $9.8 million per well in the Duvernay," he said.

TRILOGY KEEPS MOVING DUVERNAY FORWARD

Trilogy Energy has allocated approximately $65 million towards non-operated Duvernay projects in 2015, with approximately $40 million of the total expected to be spent in the second half of the year.

In the first quarter, Trilogy participated in the drilling of three (one net) and the completion of one (0.5 net) Duvernay horizontal wells. The first-quarter wells were completed through the second quarter and into the month of July.

The majority of the remaining capital is currently budgeted for Trilogy to participate as to its 30 per cent working interest in two non-operated multi-well pads that were spudded at the end of the second quarter.

Drilling operations on these two multi-well pads are expected to be completed in the fourth quarter, with completion operations to begin before year-end. Initial production from these pads is anticipated in the first quarter of 2016.

Trilogy will also be participating for its 33 per cent working interest in a non-operated well in the gas condensate area of the Duvernay play. ■

PHOTO BY NRG EXPLORATION

CONTACTS

INDUSTRY ASSOCIATIONS

Alberta Land Surveyors' Association www.alsa.ab.ca
Canadian Association of Geophysical Contractors www.cagc.ca
Canadian Association of Oilwell Drilling Contractors www.caodc.ca
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